°FORM PTO-1390 (REV 11-2000) OFFICE — U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. § 371

ATTORNEY'S DOCKET NUMBER	U S APPLICATION NO (If known, see 37 CFR 1 5)
449122019600	10/019063 Not yet assigned

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/DE00/01116	April 11, 2000	July 6,1999

TITLE OF INVENTION

METHOD AND DEVICE FOR SPEECH PROCESSING

APPLICANT(S) FOR DO/EO/US

Gerhard NIEDERMAIR

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This is an express request to begin national examination procedures (35 U.S C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.
4. ☒ The US has been elected by the expiration of 19 months from the priority date (PCT Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. ☒ is attached hereto (required only if not communicated by the International Bureau).
   b. ☒ has been communicated by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application under PCT Article 19 (35 U.S.C. 371(c)(2)).
   a. ☒ is attached hereto.
   b. ☒ has been previously submitted under 35 U.S.C. 154(d)(4).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U S.C. 371(c)(3)).
   a. ☐ are attached hereto (required only if not communicated by the International Bureau).
   b. ☐ have been communicated by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☐ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ An English language translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S C 1.821 - 1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information: 1) Application Data Sheet; 2)Int'l Search Report; 3) IPER; 4) Return receipt postcard.

CERTIFICATE OF HAND DELIVERY

I hereby certify that this correspondence is being hand filed with the United States Patent and Trademark Office in Washington, D.C. on December 27, 2001.

Melissa Garton

Melissa Garton

dc-293178

U.S. APPLICATION NO (if known, see 37 CFR 1 5)	INTERNATIONAL APPLICATION NO	ATTORNEY DOCKET NO
Not yet assigned 10/019063	PCT/DE00/01116	449122019600

21. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO.....$1,000.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....$860.00

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO.....$710.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provision of PCT Article 33(1)-(4) $690.00

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) $100.00

	CALCULATIONS PTO USE ONLY	
ENTER APPROPRIATE BASIC FEE AMOUNT =	$860.00	
Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$0	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	- 20 =		x $18.00	$0	
Independent claims	- 3 =		x $80.00	$0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $270.00	$0	
			TOTAL OF ABOVE CALCULATIONS =	$860.00	
☐ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by ½.				$0	
			SUBTOTAL =	$0	
Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +				$0	
			TOTAL NATIONAL FEE =	$0	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00 per property** +				$40.00	
			TOTAL FEES ENCLOSED =	$900.00	
				Amount to be refunded:	**$**
				charged:	**$**

a. ☒ Please charge my **Deposit Account No. 03-1952** (referencing Docket No. 44912-20196.00) in the amount of $900.00 to cover the above fees. A duplicate copy of this sheet is enclosed.

b. ☒ The Commissioner is hereby authorized to charge any additional fees that may be required, or credit any overpayment to **Deposit Account No. 03-1952** (referencing Docket No. 44912-20196.00).

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

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SIGNATURE

Kevin R. Spivak
Registration No. 43,148

December 27, 2001

Description

Method and device for speech processing

The development of workaday speech recognition systems and speech control systems has for years been one of the main lines of development of computer technology. In the course of this development, substantial advances have been achieved and marketable speech recognition systems have been established which are also proving themselves in practical use. Advanced systems of this type are also fundamentally suited for speech control of a computer and/or of connected peripherals. Simple speech recognition systems, which can, however, process only a relatively small vocabulary, are also already in use in the sectors of consumer electronics and motor vehicle equipment, as well as further sectors in which acoustic control of equipment on the basis of a limited vocabulary is possible and sensible.

As a rule, in the case of speech recognition systems there are tools which can be used to input the vocabulary to be recognized by the speech recognition system. As a rule, the words or utterances are input in orthographic notation via an appropriate interface software of the computer program and are automatically converted into the internal notation of the speech recognition system (mostly a variant of phonetic transcription (phonetic script)). In this conversion process, which is automatic or supported by lexicon look-up, errors can occur in the phonetic transcription which arise from inadequate conversion rules and/or incomplete lexica. Since the speech recognition system builds up its recognition process on the basis of the phonetic transcription thus generated, an incorrect phonetic transcription also produces errors in the speech recognition.

In order to ensure optimum performance, it must be ensured that the phonetic transcription is as correct as possible.

The problem has so far been solved in that the user has been able to check manually the phonetic transcription generated by the system after inputting of the orthographic (correct) notation. However, this is difficult, as a rule, for untrained staff. Consequently, use has been made of various aids on offer in SW on the market:

1. The user can have displayed for himself words which are typical of the various phonetic symbols and in which such symbols are contained, and can correct the phonetic notation manually. In this case, he is further supported in a few systems to the effect that no incorrect character sequences of the phonetic transcription can be used, since the software employed can input only those character strings which represent a valid ASCII sequence for the phonetic character set used.

2. The phonetic transcription is converted again into an audible speech from the phonetic notation with the aid of text-to-speech software systems, that is to say speech synthesizing methods. This serves the purpose of the acoustic plausibility check of the phoneme string which has been automatically generated by the system for a word. This audible test can, however, eliminate only drastic errors and is subject to the shortcomings of the acoustic channel. Moreover, it is necessary to ensure correspondence between the phonetic alphabets used in the speech recognition as also in the speech synthesis, and this is so in very few cases.

The invention is therefore based on the object of specifying an improved method and a device for speech processing which are distinguished, in particular, by a substantially improved user-friendliness and, in

conjunction therewith, also by enhanced accuracy and reliability.

This object is achieved with regard to the aspect of its method by a method having the features of claim 1, and with regard to the aspect of its device by a device having the features of claim 6.

The invention includes the essential idea of replacing the outputting of a word converted into phonetic transcription, something which is unfamiliar to, and can be handled only with difficulty by the linguistically untrained user, in this phonetic transcription (phonetic script) by an outputting which is simple and can be handled more reliably. It further includes the idea of selecting for this purpose an output form which is to be denoted as "pseudo-orthographic" and does not demand of the user knowledge of special characters of the phonetic transcription and of their special rules. Put simply, the outputting of the converted words is performed "in the way they are spoken".

This pseudo-orthographic outputting, which is easy to understand even for the layman and can be effectively handled, of a language converted into phonetic transcription requires an additional step in the speech processing method, specifically the step of conversion from the phonetic transcription into this pseudo-orthographic representation. This additional step includes a method in the case of which the phonetic units of the words are converted, in a self-learning fashion or with access to a predetermined set of rules, into simple graphemic units of written script. This conversion is performed in a simple and expedient embodiment by accessing a stored phoneme/grapheme assignment table which is initialized at least with an initial stock of assignment rules and can, if appropriate, be extended by the user in the course of a

self-learning process during the application of the system on the basis of additional inputs.

In a particularly convenient design which is advantageous for the purpose of the self-learning process mentioned, the method also comprises a further conversion step of reverse conversion into the phonetic transcription from a pseudo-orthographic representation (employed by the user when inputting for the purpose of correcting the primary conversion result). The tabular assignment mentioned can also be used in this step and, if appropriate, can be supplemented and refined in the course of a self-learning process.

In accordance with the method features specified above, in addition to a first converter unit known per se for converting an orthographic input into the phonetic transcription, a device for carrying out the proposed method has a second converter unit for converting from the phonetic transcription into the pseudo-orthographic representation mentioned, and an output unit for outputting in this form of representation.

The device has an appropriate third converter unit for the abovementioned development of the method, which permits the user to make a correcting input by using the pseudo-orthographic representation.

In order to apply the phoneme/grapheme assignment table mentioned, in a preferred embodiment the device has an appropriate memory in which this assignment table is held accessibly for the second and/or third converter unit.

Advantages and expedient features of the invention emerge for the rest from the subclaims and the following description of a preferred exemplary embodiment with the aid of the figure.

The figure shows a schematic illustration of a speech processing device 1 for carrying out the method according to the invention in an embodiment in the form of a functional block diagram. The speech processing device 1 comprises an acoustic input unit 3 at whose output a preprocessed stream of speech S1 is present which is fed to an input of a speech recognition unit 5 which outputs a written text S2. The speech recognition unit 5 comprises a vocabulary memory 5a in which the vocabulary of the speech recognition unit is stored in the phonetic notation customary in conventional speech recognition systems.

The vocabulary memory 5a is continuously updated by the input of additional terms by means of an alphanumeric input unit 7, which terms are converted from the orthographic input format in a first converter unit 9 into the phonetic transcription (phonetic script). A lexicon memory 11 supports the conversion procedure in the first converter unit 9. For the purpose of checking and correcting undertaken inputs, a second converter unit 13 is provided for converting the phonetic transcription into a pseudo-orthographic representation. This is indicated on a display screen 15 for the user.

Also provided is a third converter unit 17 for converting pseudo-orthographic inputs via the alphanumeric input unit 7 into phonetic notation, the output of which is connected to the vocabulary memory 5a of the speech recognition unit 5. The second and third converter units 13, 17 are assigned an assignment memory 19, organized in the form of a look-up table, for predetermined phoneme/grapheme assignments.

An input, performed by the user, of a new term in correct orthographic notation is converted in the first converter unit 9 into phonetic script and can - depending on the actual organization of the system - already be fed in this form to the vocabulary memory

5a. In each case, the word converted into phonetic script is fed, however, to the second converter unit 13, where a further conversion into a pseudo-orthographic representation is performed, which is displayed on the display screen 15 and causes the user, if appropriate via the input unit 7 - now in the pseudo-orthographic representation, which also appears on the display screen - to make a correcting input, or else to confirm the displayed pseudo-orthographic representation. The pseudo-orthographic input is converted in the third converter unit 17 into phonetic script and now (for the first time or, if the word has already been taken over into the vocabulary memory 5a on the occasion of the first input, in a correction mode) fed to the vocabulary memory 5a. The contents thereof are thereby expanded by a word checked with regard to the phonetic notation.

The procedure described above is explained below using two examples:

1st example

"Jacques Chirac" is input in correct orthographic notation via the alphanumeric input unit 7. The phonetic notation "sh a xk sh i: rr a xk" is formed therefrom in the first converter unit 9. The second converter unit 13 forms "sch a k sch i r a k" therefrom, and the input name is displayed on the display screen 15 in this notation. It is possible - without knowing the phonetic alphabet used in the first conversion - to perceive from this representation that the phonetic notation generated by the system is adequate. The user can confirm the conversion result, and the newly input name passes (in phonetic notation) into the vocabulary memory 5a.

2nd example

"Professional Service" is input via the input unit 7. The first converter unit 9 generates therefrom in phonetic notation
"p r o: f ae sh o n :e: ll s oe r v i: cc :e". In the result of the further conversion in the second converter unit 13, "Profäschonell Sörwieke" is yielded therefrom in pseudo-orthographic notation, and this representation is again displayed on the display screen 15.

The user perceives straight away that the phonetic script generated by the system cannot be correct, since it does not correspond to the usual pronunciation of the input word combination. The user will now use the input unit in conjunction with the pseudo-orthographic notation, which is illustrated on the screen, to undertake a correction, and the correction result is converted again in the third converter unit 17 from the pseudo-orthographic notation into the phonetic one, and taken over in this form into the vocabulary memory 5a. In the example given, the user will therefore input "Profäschonnell Sörwis", and the new word combination (in phonetic notation) is anchored in the vocabulary memory.

It is to be seen that the specified method can also be carried out in a plurality of steps when, after a first correction by the user, a further conversion from the phonetic notation into the pseudo-orthographic one is performed in conjunction with a further display in this representation such that, if appropriate, system errors can be eliminated iteratively. In this case, it is preferred to apply a self-learning system - known per se - for example in the form of a neural network with the aid of which a self-adaptation of the memory contents of the assignment memory 19 and/or the assignment rules of the first conversion operation (orthographic - phonetic) can be performed.

The design of the invention is not limited to the example described above, but is also possible in a multiplicity of modifications which are within the scope of expert activity.

Patent claims

1. A method for speech processing, in which an orthographic input is converted into a phonetic transcription in a first conversion step, and a step of checking and correcting the conversion result by the user is provided, characterized by a second step of converting from the phonetic transcription into a pseudo-orthographic representation and outputting in this representation.

2. The method as claimed in claim 1, characterized by a third step of converting an input performed in the pseudo-orthographic representation into the phonetic transcription.

3. The method as claimed in claim 1 or 2, characterized in that the second and/or third conversion step comprises a conversion of phonetic word units into simple graphemic script units, or vice versa.

4. The method as claimed in claim 3, characterized in that the second and/or third conversion step is executed by accessing a stored phoneme/grapheme assignment table (19).

5. The method as claimed in claim 3 or 4, characterized in that the second and/or third conversion step is executed by means of a self-learning method, in particular by using a neural network for continuous updating of the phoneme/grapheme assignment table (19).

6. A device (1) for carrying out the method as claimed in one of the preceding claims, having an alphanumeric input unit (7) and a first converter unit (9), connected to the latter on the input side, for converting an orthographic input into a phonetic transcription, and a display unit (15) for optically displaying an input word, characterized by a second converter unit (13) for converting from the phonetic

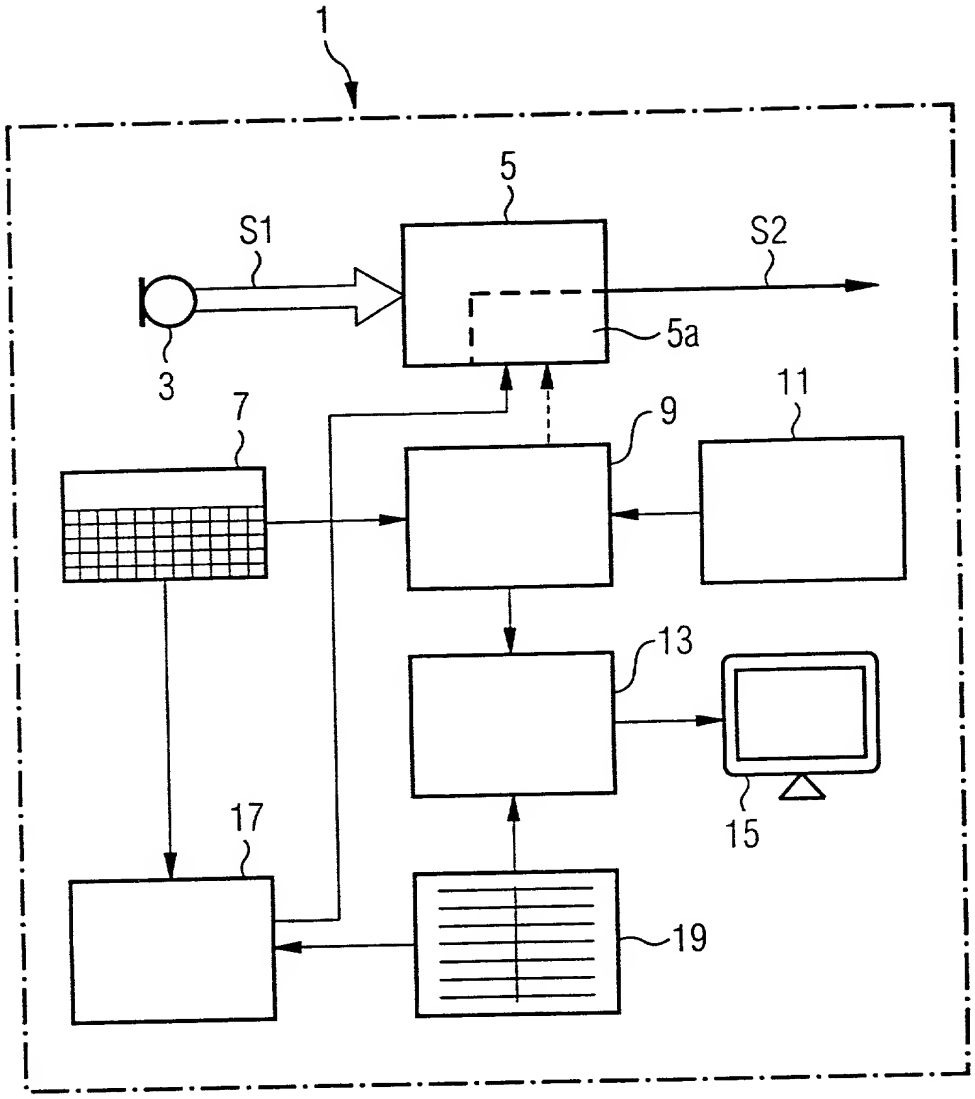
transcription into a pseudo-orthographic representation, which is connected on the output side to the display unit.

7. The device as claimed in claim 6, characterized by a third converter unit (17) for converting an input performed in the pseudo-orthographic representation into the phonetic transcription.

8. The device as claimed in claim 6 or 7, characterized in that the second and/or third converter unit (13, 17) is connected to a memory (19) for storing a phoneme/grapheme assignment table.

9. The device as claimed in one of claims 6 to 8, characterized in that the second converter unit (13) is connected on the output side to a vocabulary memory (5a) of a speech recognition unit (5).

10-019,063



Declaration and Power of Attorney For Patent Application
Erklärung Für Patentanmeldungen Mit Vollmacht
German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Verfahren und Vorrichtung zur Sprachverarbeitung

deren Beschreibung

(zutreffendes ankreuzen)
☐ hier beigefügt ist.
☒ am 11.04.2000 als
PCT internationale Anmeldung
PCT Anmeldungsnummer PCT/DE00/01116
eingereicht wurde und am ______
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Method and device for speech processing

the specification of which

(check one)
☐ is attached hereto.
☒ was filed on 11.04.2000 as
PCT international application
PCT Application No. PCT/DE00/01116
and was amended on ______
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign appplications
Priorität beansprucht

			Priority Claimed	
19931050.5	DE	06.07.1999	☒	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein
			☐	☐
(Number)	(Country)	(Day Month Year Filed)	Yes	No
(Nummer)	(Land)	(Tag Monat Jahr eingereicht)	Ja	Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozeßordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35. United States Code. §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occured between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/01116	11.04.2000	anhängig	pending
(Application Serial No.)	(Filing Date D, M, Y)	(Status)	(Status)
(Anmeldeseriennummer)	(Anmeldedatum T, M, J)	(patentiert, anhängig, aufgegeben)	(patented, pending, abandoned)
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Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissentlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden koennen, und dass derartig wissentlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patentes gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: *(Name und Registrationsnummer anführen)*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. *(list name and registration number)*

And I hereby appoint

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2000 Pennsylvania Ave., NW 20006-1888 Washington, DC
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or
Customer No. 25227

Voller Name des einzigen oder ursprünglichen Erfinders:	Full name of sole or first inventor:
GERHARD NIEDERMAIR	GERHARD NIEDERMAIR
Unterschrift des Erfinders Datum	Inventor's signature Date
17.12.01	
Wohnsitz	Residence
VIERKIRCHEN, DEUTSCHLAND DEY	VIERKIRCHEN, GERMANY
Staatsangehörigkeit	Citizenship
DE	DE
Postanschrift	Post Office Addess
LUDWIG-THOMA-STR. 9	LUDWIG-THOMA-STR. 9
85256 VIERKIRCHEN	85256 VIERKIRCHEN
Voller Name des zweiten Miterfinders (falls zutreffend):	Full name of second joint inventor, if any:
Unterschrift des Erfinders Datum	Second Inventor's signature Date
Wohnsitz	Residence
,	,
Staatsangehörigkeit	Citizenship
Postanschrift	Post Office Address

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).